

REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and the following remarks.

Claims 1-11 are pending in this application.

The claims have been amended to make minor changes, in order to better comply with U.S. practice. No new matter has been added to the application by these amendments.

I. Claim Rejections Under 35 U.S.C. § 103

The Examiner rejects claims 1-3 and 8-11 under 35 U.S.C. § 103(a) as being unpatentable over Sirek et al. (U.S. Patent No. 6,649,792, "Sirek") in view of Applicants' alleged admitted prior art (pages 1-3 of the specification) further in view of Shiiki et al. (U.S. Patent No. 6,673,403, "Shiiki") and Bigg et al. (U.S. Patent Application Publication No. 2002/0123546, "Bigg").

The Examiner also rejects claims 4-7 under 35 U.S.C. § 103(a) as being unpatentable over Sirek in view of Applicants' alleged admitted prior art further in view of Shiiki and Bigg, as applied to claim 1, further in view of Roh et al. (U.S. Patent No. 6,031,128, "Roh").

Applicants respectfully traverse the rejections.

Claim 1 is directed to a method of recycling a laminate shaped product...thereby recovering the principal resin from the laminate shape product having a laminate structure including at least a layer of aliphatic polyester resin (e.g., a glycolic acid polymer as recited in claim 8) and a principal resin layer (e.g., PET as recited in claim 9), by washing broken pieces of

the laminate shaped product with alkaline water to remove the aliphatic polyester resin layer to recover the principal resin.¹

Sirek is directed to a method of chemical recycling of polyethylene terephthalate (PET) waste to recover the chemical sources of PET, i.e., terephthalic acid and ethylene glycol. See Sirek, col. 3, lines 30-38 and claim 1. However, the method of chemically recycling PET waste to recover terephthalic acid and ethylene glycol, as disclosed in Sirek, is quite different from the claimed method of recycling a laminate product and thereby recovering the principal resin. In the claimed method, the principal resin (e.g., PET in claim 9) is recovered as a chemically intact resin, from a laminate shaped product that includes a principal resin layer and at least one aliphatic polyester resin layer, by selectively removing the aliphatic polyester resin layer by washing broken pieces of the laminate shaped product with alkaline water. Thus, in the claimed method, the principal resin (e.g., PET) is chemically intact, whereas Sirek teaches a method of chemically recycling PET waste to recover terephthalic acid and ethylene glycol separately. Accordingly, one of ordinary skill in the art would have had no reason or rationale to have developed the claimed method of recycling a laminate shaped product from Sirek, because Sirek teaches recovering the components of PET and the claimed method recovers the principal resin.

The Examiner asserts that Applicants disclose that PET resin with a gas barrier coating is a desirable composition for bottles, and that it is desirable to recycle these bottles. In addition, the Examiner states that Shiiki discloses that polyglycolic acid is a gas barrier layer commonly used with PET base resin for drink containers. Thus, the Examiner argues that it would have

¹ Please see claim 4 of WO 03/097468 (cited in Applicants' Information Disclosure Statement of May 16, 2006), which corresponds to U.S. Serial No. 10/514,048.

been obvious to modify the process of Sirek to include PET bottles containing a polyglycolic acid gas barrier layer, because gas barrier layers improve preservability and polyglycolic acid is a suitable barrier layer that imposes little burden on the environment.

However, Applicants' specification and Shiiki simply disclose that the laminated product to be treated by the present invention is a useful product and is desirably recycled. The combination of Sirek with the disclosure that the laminate product is useful and desirably recycled would not have led one of ordinary skill in the art to the claimed method. Specifically, Applicants' alleged admitted prior art and Shiiki fail to remedy the deficiencies of Sirek, as discussed above.

Moreover, the Examiner admits that Sirek does not explicitly teach adjusting the moisture content of the aliphatic polyester resin layer, but asserts that Bigg teaches that aliphatic polyesters begin degrading when the moisture content increases in the polymer. The Examiner asserts that it would have been obvious to modify the process of Sirek to include a step of adjusting the moisture content of the aliphatic polyester resin, because it is desirable to separate the aliphatic polyester from the PET resin in a composite bottle, and increasing the moisture content of the aliphatic polyester increases the degradation rate, therefore reducing the time required for the recycling process. See Office Action at page 3, lines 12-19.

However, Bigg's Fig. 1 and paragraph [0020] merely disclose that a process of biodegradation of an aliphatic polyester involves many unit-stages, beginning with diffusion of water (i.e., moistening) of the aliphatic polyester. Bigg teaches acceleration of the degradation process. However, the acceleration is actually performed by addition of an activator compound,

rather than by adjusting the moisture content, as claimed. See Bigg at claims 1 and 20. Bigg does not teach or suggest the placement of a moistening step before an alkaline water treatment as a means for shortening the alkaline water treatment.

Accordingly, Sirek, Applicants' alleged admitted prior art, Shiiki and Bigg do not teach or suggest the claimed method of recovering a principal resin (e.g., PET) from a laminate shaped product having at least one aliphatic polyester resin layer (e.g., a glycolic acid polymer) by removing the aliphatic polyester resin layer.

Therefore, claim 1 would not have been rendered obvious by Sirek in view of Applicants' alleged admitted prior art, Shiiki and Bigg. Claims 2, 3 and 8-11 depend from claim 1, and thus also would not have been rendered obvious by Sirek in view of Applicants' alleged admitted prior art, Shiiki and Bigg.

Roh is cited for rejecting claims 4-7 in combination with the above-cited references. However, Roh merely discloses a concentration of caustic soda in connection with a chemical decomposition of PET into chemical sources thereof, similar to Sirek. Therefore, Roh fails to remedy the deficiencies of Sirek, Applicants' alleged admitted prior art, Shiiki and Bigg. Claims 4-7 depend from claim 1, and thus also would not have rendered obvious by the references.

Accordingly, reconsideration and withdrawal of the rejections are respectfully requested.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-11 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place the application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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